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ABSTRACT

This study compared self-recording and self-recording plus self-reinforcmeent treatments with no self-recording treatment on the spelling achievement and on-task behavior of 38 children (ages 10 to 13) with severe emotional and behavioral disorders. In the self-recording groups, subjects corrected, recorded, and graphed their daily spelling tests. The self-recording plus self-reinforcement group also set a goal and selected a reinforcer for meeting their goal each week. Weekly self-efficacy ratings and attributions for success and failure were also examined. Followup data were collected to determine the durability of spelling achievement over time. The results indicated the groups did not differ in spelling achievement. The self-recording only group had a significantly higher rate of on-task behavior when compared to the control group with no self-recording and the group with self-recording plus self-reinforcement. There were also no significant differences among groups in measures of self-efficacy or attributions for success and failure. (Contains 21 references.) (DB)

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The Effect of Self-Recording and Self-Recording Plus Self-Reinforcement on Spelling Achievement

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Abstract

Self-recording and self-recording plus self-reinforcement treatments were compared to no self-recording treatment in terms of effect on spelling achievement and on-task behavior for students with emotional/behavioral disorders. In the self-recording groups, subjects corrected, recorded, and graphed their daily spelling tests. The self-recording plus self-reinforcement group also set a goal and selected a reinforcer for obtaining their goal each week. Weekly self-efficacy ratings and attributions for success and failure were also examined. Follow-up data were collected to determine the durability of spelling achievement over time. The results indicated the groups did not differ in spelling achievement. The self-recording only group had a significantly higher rate of on-task behavior when compared to the control with no self-recording and self-recording plus self-reinforcement. Implications and areas for future research are discussed.

Over the past two decades, applied behavior analysis literature has shown that a teacher can bring a student's behavior under control in a structured setting (Rutherford & Nelson, 1988). Some of the behavior modification methods that are highly effective include reinforcement, response cost, modeling, prompting and time out. For the most part, those applying contingency management programs have achieved success, but these programs must be implemented, monitored, and controlled by the teacher. Kneedler and Hallahan (1981) argue such teacher managed, external techniques promote student passivity because the students are not involved in their own behavior change.

Teachers are expected to be responsible for managing the social behavior of a child in the classroom. Rosenbaum and Drabman (1979) have argued that because of their involvement with managing behavior, the teachers' time available for direct instruction is decreased. Also, when adults work with several children simultaneously, a great deal of misbehavior may go unobserved. When a child has learned to manage his/her own behavior, teachers can spend more time teaching other important skills without worrying about unobserved inappropriate behavior. Teacher responsibility for managing behavior can be delegated to the students themselves after they have been prepared to exercise it.

One of the goals of education is to teach children to take responsibility for their actions. Acting independently is valued and expected in our society (O'Leary & Dubey, 1979). Self-management procedures can be an effective means of achieving the goal of teaching responsibility while simultaneously improving children's academic skills and prosocial behavior. Self-management and self-control, often used interchangeably, refer to teachable strategies that a student uses to alter his/her own behavior. A behavior management program that reduces behavior problems and

focuses on social and academic growth, involving students as their own trainer, would be desirable.

Whereas external management programs often fail to produce durable and generalizable behavior change, self-management procedures appear to promote generalization of learned behavior by incorporating self-mediated stimuli which aids the generality of the behavior change. Stokes and Baer (1977) emphasized that generalization does not always occur just because a behavior change has been accomplished. To be effective, a behavior change needs to occur over time, settings, and the effects should spread to related behaviors.

One of the guiding principles of special education programming established by the Education for All Handicapped Children Act in 1975 is that students with disabilities should be educated in mainstream settings whenever possible. This has been emphasized more recently by advocates of the "Regular Education Initiative" (REI), who promote the training of regular education teachers to serve larger numbers of students with disabilities (Reynolds, Wang, & Walberg, 1987). The ultimate goal is to teach special needs students to become adjusted in all settings, in other teachers' classrooms, at home, and in the community. Special education and regular education teachers may welcome behavioral self-control as a viable procedure to involve students in their behavior change process and as a promising method of increasing generalization and maintenance of behavior (Hughes, Ruhl, & Misra, 1989).

Numerous studies have found that self-management can be an effective treatment technique for students with or without disabilities. It can be effective under a variety of circumstances and with a variety of children for behavioral excesses as well as deficits. The therapeutic value of the reactive effects of self-recording itself has been

established with diverse behaviors and individuals. In school situations, many studies have shown that self-recording does enhance attention to task. But often on-task is the sole target behavior and dependent variable, and this research has indicated that increased on-task does not necessarily improve academic performance (Klein, 1979). Attention itself is not a sufficient ingredient for academic learning. Making an active academic response is crucial to learning (Graden, Thurlow, & Ysseldyke, 1983). Klein (1979) and Snider (1987) suggested that academic performance would be more appropriate for self-recording. However, such studies are rare.

The bulk of literature on self-management has focused on the dependent variable of on-task and the subjects were children with learning disabilities. Self-management with students identified with behavior disorders is represented less in the literature. These children are recognized by educators as having faulty emotional and behavioral controls. When their behavior violates the rights of others or obstructs their own learning process, it is considered disruptive (Fagen, Long, & Stevens, 1975). Many of these children with behavior problems have learned to adapt to unstable circumstances by means of impulsive actions. Essentially, little value is placed on self-management by these children. This is probably because the children with emotional and behavioral disorders derive insufficient material or social satisfaction from delaying immediate actions. Furthermore, children with behavior disorders are likely to experience many social and emotional difficulties because their inappropriate behavior triggers negative responses from others. This in turn may contribute to feelings of inadequacy and social rejection. Inability to perform according to the expectations of the classroom can also become a source of dissatisfaction for the child, his classmates, and his teacher.

A curriculum aimed at improving one's behavior should serve to promote a

more desirable educational balance between cognitive and affective development. Self-management assures the possibility of exercising personal choice about one's own manner or degree of involvement in the task. Performance on the task in relation to one's goals forms the true substance of self-esteem. It is clear that a child must believe himself capable of controlling his own behavior through self-directed efforts. For students with behavior disorders, self-monitoring offers an alternative to external control, allowing the student active participation in his/her behavior change.

Self-monitoring /self-recording studies with different populations on specific academic variables such as accuracy and achievement are severely limited. Therefore, self-recording of an academic performance variable appears to be a promising research direction. The addition of self-reinforcement to a self-recording procedure may strengthen the effects of academic achievement as well as contribute to an enhanced self-esteem for those students with behavior disorders. This may lead to opportunities to receive naturally occurring reinforcement in the environment.

Specifically, the purposes of the study were to: (a) compare the effect of self-recording of correct academic responding, self-recording plus self-reinforcement, and no self-recording on spelling achievement for students with emotional and behavioral disorders (EBD) (b) compare the differences in on-task behavior for EBD students using self-recording, self-recording plus self-reinforcement, and those not using self-recording; (c) determine if there are differences in students' attributions for success and failure in academic tasks which are related to their involvement in self-management; and (d) examine whether self-recording strengthens self-efficacy ratings.

For the purpose of this study the following definitions of key terms are provided: (a) self-monitoring refers to the observation of one's behavior to discern the presence

or absence of a behavior; (b) self-recording refers to the actual recording of self-observations; and (c) self-reinforcement refers to self-determined and/or self-administered contingencies chosen by the child in contrast to teacher determined and administered.

Method

Subjects

Subjects participating in the study were 38 students who were identified with emotional and behavioral disorders as a primary disability. The students attended schools with Level 4 or 5 self-contained placement. Level 4 was defined as a placement where students receive 50% or more but less than 100% of their education in special education . They typically attended a neighborhood school. Students in Level 5 were usually transported to another school district for full-time special education services. The students were selected from four elementary schools in Minnesota. Two schools were urban inner city, one suburban and one school was in a small town 37 miles from the metro area.

Because of the subjectivity inherent in determining if a particular individual is behaviorally disordered and the individual variability in achievement , several marker variables were used to describe the sample (Keogh, Major-Kingsley, Omari-Gordon, & Reid, 1982).

Table 1 provides basic background information on the subjects in the study. The descriptive markers are: number of subjects by sex, chronological age, grade level, locale, race/ethnicity, source of subjects, socioeconomic status, language, educational history, educational placement and physical health status. To obtain an index of socioeconomic status, data were collected on free/reduced lunch which is based on parental income. Health-related absences could not be separated from total

absences, therefore total absences for the period of six months were reported. Ethnicity was provided by a sight count of the classroom teacher.

Insert Table 1 about here

Three instruments were used to provide substantive markers for the sample groups. The spelling subtest of the Basic Academic Skills Samples (BASS) (Espin, Deno, Maruyama, & Cohen, 1989), What I Am Like (Renick & Hartar, 1988), and Peer-Preferred Social Behaviors subscale of the Walker-McConnell Scale of Social Competence and School Adjustment (Walker & McConnell, 1989) describe spelling achievement, academic self-perceptions, and appropriate peer-related social behaviors respectively. These are described more completely under the Instruments section.

Instruments

The first three measures, Basic Academic Skills Samples, What I Am Like, and the Walker-McConnell Scale of Social Competence and School Adjustment were used to provide a description of the sample: therefore, were not dependent measures.

Basic Academic Skills Samples. The spelling probe of the Basic Academic Skills Samples (BASS) (Espin et al., 1989) was administered to all subjects prior to treatment to assess an index of student achievement in the basic academic skill area of spelling. This spelling probe consisted of two lists of 17 words. Each list was administered in two minutes. The spelling words were selected from the Harris-Jacobson Word List (1972), Pre-Primer to Grade 3. Spelling words were scored

according to the number of words spelled correctly (WSC) and the number of correct letter sequences (CLS). In the development of this instrument, age-related differences on the BASS scores were examined by comparing the mean grade level scores on the spelling subtest. On the spelling measure there was a negatively accelerating trend across grades. Mean scores leveled off for the upper grades reflecting a ceiling effect in the scores for students in grades five and six. For the purpose of this study, the BASS was used to describe the level of achievement for students with emotional and behavioral disorders in Grades 4, 5, 6. The ceiling effect was not a problem with this population.

What I Am Like. Student self-perceptions were assessed using a revised version of the Pictorial Scale of Perceived Competence and Social Acceptance for Young Children (Hartar & Pike, 1981) and the Self Perception Profile for Learning Disabled Students (Renick & Hartar, 1988). The revisions were made based on the technical data provided in the test manual. There were a total of 35 questions on this instrument with a structured alternative format. Findings from four separate samples found the internal consistency reliabilities for all six subscales acceptable on the "What I Am Like" self-perception scale. The Behavioral Conduct Scale showed somewhat lower reliabilities. The samples were drawn from Colorado primarily from neighborhoods ranging from lower middle class to upper middle class, predominantly Caucasian.

The BASS spelling test and revised Self-Perception Scale were administered as a battery by trained graduate students. For effective administration of the "What I Am Like" instrument, the questions were read orally by one proctor and at least two other proctors circulated the room to check for understanding and reinforced for on-task behavior.

Walker-McConnell Scale of Social Competence and School Adjustment. Data on appropriate peer-related social behaviors were obtained through ratings made by the student's teacher on the Walker-McConnell Scale of Social competence and School Adjustment (Walker & McConnell, 1988). Teachers completed the item Subscale 2 (Peer-Preferred Social Behavior) within the first two weeks of the study. The studies and evidence presented in the technical manual support the overall validity of the Walker-McConnell total scale and subscales. The estimates of the Walker-McConnell test-retest stability and internal consistency were in the high to moderate range.

Spelling Achievement. A spelling pre- and posttest was administered one week prior to treatment and then one week after treatment to assess growth in spelling. The spelling achievement pre- and posttest were comprised of two lists of 20 words each, randomly selected from the 120 grade level word lists used during the six week treatment. The fourth, fifth, and sixth grade words were selected from Harris and Jacobson (1972) word lists. Due to the low achievement level of some of the students , a second grade word list was used with nine students. This list was drawn from the Iowa List of Words Most Frequently Used in Children's Writing used by the suburban school district. The pre-posttest was administered and scored in the same manner as the Basic Academic Skills Samples. Twenty words were randomly selected from the posttest to assess maintenance of spelling achievement three weeks following treatment.

On-task Observation. The PLACHEK-Planned Activity Check (Doke & Risley, 1971) was used to collect data for group on-task behavior. On-task was defined as any time a student has his or her eyes focused on a book, paper, was writing, or checking words or was requesting assistance from a peer or teacher. A random

sample of three to four students from each classroom was observed for the first 15 minutes or length of the spelling period. A momentary time sampling at 1 minute intervals was used to measure the percentage of on-task.

Self-Efficacy Scale. The student's weekly efficacy judgment was measured by a one-item Likert scale developed by the investigator. This efficacy scale was based on the studies in self-efficacy of Schunk (1981). The Likert scale ranged from 1 to 5 with the anchor points of Not At All (1), Pretty Sure (3), and Very Sure (5). The students privately judged their capability to write spelling words correctly on Friday's test.

Attribution Scale. A measure was developed by the investigator in an effort to arrive at causal ascriptions of achievement outcomes in terms of ability, effort, task difficulty, and luck. The students chose one alternative out of eight that described why they got the grade they did on their 20-word spelling test each Friday (e.g., "I am good in school" or "The spelling words were too difficult"). The teacher recorded the actual spelling score on this form each week during the six-week treatment period.

Student Satisfaction Scale. To assess the students' satisfaction with the treatment procedures, a five-question 5-point Likert scale was developed. The statements addressed the specific procedures used during the treatment phase with experimental groups (e.g., self-correcting, short pretests, graphing). The anchor points of the five items were Strongly Disagree (1), Uncertain (3) and Strongly Disagree (5). The Student Satisfaction Scale was administered at the end of the study to the two experimental groups. The students responded anonymously.

Procedures

The experimental design of this study was characterized by a pretest-posttest

control group design. Subjects were assigned to one of the three conditions. One classroom in the suburban school was split with four students in each of the two experimental groups. This assignment was done first because this classroom started the treatment three weeks earlier to allow three weeks of treatment prior to spring break. The remaining classrooms were assigned to a condition by drawing slips of paper with classroom numbers on.

Each student was provided with a numbered personal folder for the spelling tasks. The folder for the non-self-recording group consisted of the list of words prepared for each day of the week and the study steps glued inside the folder. In addition to these materials, the experimental groups were provided with a self-recording form for each week, a six week graph, and tables to convert the number correct each day to a percentage. The appropriate materials were inserted into each student's folder each day. The teachers were provided with grade level lists for the six week treatment period. Each 20 word list was divided into five word lists for daily use Monday through Thursday and a 20 word list for Friday. All other additional forms were provided to the teacher for the six week intervention.

The subjects of this study were paired to facilitate the administration, correcting and recording of the daily activities for the six week period. The teachers paired the students according to ability level or in pairs that could work together adequately. When a student was absent or there was an odd number of students in the room, the teacher or paraprofessional participated.

At the teacher's request each day, the students in all three conditions who were designated as the "movers": gathered their materials and sat with their partner (stayer). The mover administered the 5 word practice spelling test on Monday through Thursday to his partner. The 20 word spelling test was administered on Friday. The

spelling test was given by first saying the word, saying the word in a sentence, and repeating the word. After administering the entire list, the partners would switch roles. The stayer administered the spelling list to his partner in the same way.

The students in all conditions corrected their words and studied those that were incorrect using the study steps glued into their individual folders.. The students could also quiz each other.

The students in all conditions completed the one item Self-Efficacy Scale on Monday before the administration of the practice test. At the end of the spelling session on Friday, each student chose one response on the Attribution Scale that described why they got the grade they did on their 20 word spelling test.

Experimental 1. In addition to the above standardized spelling procedures for all conditions, the self-recording only group recorded the number correct each day on the form provided. On Monday through Thursday, they recorded the number correct out of five and on Friday the number correct out of 20. These scores were converted to percent correct using the correct table glued into their folder. The percent correct was graphed by coloring up to the correct value on the graph which was prepared for the entire six weeks.

Experimental 2. The students in the third condition followed all the above procedures with the added component of goal setting. Each Monday, the students set a goal for the number of correct words they would achieve out of 20. The student talked privately with the teacher in setting the goal and then agreed on a reinforcer to be earned upon meeting the criterion. The goal and reinforcer were recorded by both the student and the teacher. The teacher was instructed to praise each student for setting stringent goals, but a goal that could successfully be obtained. Students were encouraged to set higher goals if capable.

During each spelling session, the teachers monitored the students to see that the tutoring procedures were carried out correctly. They were also asked to spot check folders for consistent and accurate self-recording.

Observation of on-task was done by the paraprofessional or teacher two to three times per week by randomly selecting three days to observe. The prescribed observation procedure was carried out for the first 15 minutes of the spelling session or the actual length of the spelling session, if shorter. The paraprofessionals and classroom teachers were trained individually by the investigator. Step by step directions were provided as well as practice in doing the observations.

Results

In the analysis of data it was initially established that pretest differences were not significant through a one-way analysis of variance (ANOVA) when scores were compared for experimental to control groups on the following variables: Basic Academic Skills Samples; What I Am Like; and the Walker-McConnell Peer-Preferred Social Behavior subscale. Furthermore, there were no significant differences between subgroups (classrooms) within each condition on any of the above measures.

The first research question addressed the effect of self-recording only, self-recording plus self-reinforcement, and no self-recording on spelling achievement for correct letter sequences and words spelled correct. A repeated measure ANOVA revealed no significant main effect of the between groups factor for correct letter sequence ($F = .06$, $p = .945$). This information showed that in this sample of students with emotional and behavioral disorders, the control and experimental groups performed the same for correct letter sequences on the Spelling Achievement Test. The within subjects factor (time) was significant ($F = 19,58$, $p = .001$)

showing that all groups made significant gains in spelling achievement for correct letter sequence for the treatment period. The second part of the analysis addressed whether there were differential effects for words spelled correct. These data showed that the pre- and posttest means for the self-recording group were higher than the control and self-recording plus self-reinforcement group. When an analysis of covariance (ANCOVA) was used to adjust for the differences in the spelling pretest means, the main effects for words spelled correct were not significant. As expected, the within factor (time) was also significant ($F = 44.52$, $p = .001$) showing that words spelled correct were significantly greater for treatment regardless of the group. In summary, the entire group showed a significant increase in both correct letter sequences and words spelled correct for the treatment period. However, the groups did not differ in performance for correct letter sequences or words spelled correct.

The differences in the mean rate of on-task behavior for the groups were addressed in the second research question. A reliability of measurement for on-task behavior was done by having the investigator and classroom teacher or paraprofessional do a simultaneous but independent observation of the behavior. Reliability was conducted at least three to four times with each classroom during the six week treatment period. Interobserver agreement of on-task behavior was calculated by dividing the number of agreements by the total number of agreements and disagreements and multiplying by 100. The range and mean of interobserver agreement for all observations was 57% to 100% ($M = 85.5\%$).

The on-task data were plagued by attrition. For the on-task observation data, all six weeks were recorded for only 14 students. In order to obtain a count of at least five subjects in each of the three groups (control, self-recording, self-recording plus self-reinforcement), the following strategy was employed. All cases with more than

one missing week out of the six weeks possible were dropped. For subjects with five of the six weeks, the missing week was estimated from the two surrounding weeks. To roughly assess the appropriateness of this method, the data with all six weeks (i.e., complete data) were used to calculate an estimate of each week, following the above process. Then the estimated data were correlated with the observed data for each week. All the correlations for on-task data were significant. To accommodate the estimated data, the degrees of freedom for the Huynh-Feldt epsilon adjustment were used, even though sphericity assumptions were not violated (i.e., the DF were reduced yielding a more conservative test). A repeated measures ANOVA in Table 2 showed that groups differed significantly among themselves for percentage of on-task behavior ($F = 18.34$, $p = .001$). Results of Tukey's HSD follow-up test found the self-recording only group significantly higher for percentage on-task than the control and self-recording plus self-reinforcement, which did not differ. A repeated measures ANOVA (Huynh=Feldt) was used to examine differences within the group because of the small total number. Within the entire group the percentage of on-task behavior showed a significant increase for the treatment period.

Table 2 about here

The third research question addressed whether there were differences in attributions for success and failure for those students involved in self-recording and the control group. These data were first dichotomized into two attribution dimensions, either internal or external to the individual. Ability and effort represented internal causes for success or failure to the individual. Task difficulty and effort represented the external causes for success or failure. A Chi-square analysis revealed no significant

differences for internal/external causes of success or failure for any week among the treatment groups. Further analysis were not done due to attrition.

The fourth research question addressed whether those using self-recording and those not self-recording would differ in self-efficacy ratings over time. The same strategy was employed for the missing self-efficacy data as was described earlier for missing on-task data. All but one of the correlations were significant at $\leq .05$ (one-tailed test of significance). The exception was week one of the data, with a p-value of .069. Because week one was imputed for only one subject, that rating and its estimate were included. This increased the total number by eight to 30 students to be included in the analysis. The repeated measures ANOVA (Huynh-Feldt) revealed no significant differences between groups. The within factor also revealed no significant increase during the six week treatment period.

Pearson-Product-Moment correlations were calculated for correct letter sequences and words spelled correct on the Spelling Achievement posttest and the follow-up spelling test. Statistically significant correlations were obtained between the posttest and follow-up test for correct letter sequences and words spelled correct for all groups.

Positive results were obtained from the Student Satisfaction Scale that was administered to the experimental groups. The 5-point Likert scale was collapsed into three categories: Disagree (1 and 2), Uncertain (3), and Agree (4 and 5). The two highest percentages of positive agreement were "Writing down my score each day helped me know how I was doing in spelling" (83%) and "Graphing my percentage in spelling was fun for me" (75%).

Discussion

The present study evolved out of the premise that students with emotional and behavioral disorders who are in self-contained classrooms may benefit from self-management procedures in their classroom prior to mainstreaming. In this study, two groups of students were trained to self-record their daily spelling achievement. It was proposed that through intervention these students with emotional and behavioral disorders would observe their behavior and its outcomes. The student would then compare his performance against some established standards which would presumably lead to either positive or aversive covert and/or overt self-reinforcement. The advantages for this type of procedure are threefold: (a) eliminates the intrusiveness of operant techniques, (b) decreases reliance on adult approval and artificial reinforcers, and (c) promotes greater free will in making choices.

The results of this intervention program were assessed by examining the scores on the pre- and posttest spelling measure and observation of on-task behavior. When mean scores were compared for experimental to control groups it was established that pretest differences in descriptive measures were not significant through analysis of variance. The three groups were comparable in spelling achievement, academic self-perceptions, and peer-related behavior. The subgroups within each condition were also comparable on all the above measures.

Given the statistical results of this study, the hypotheses for differences in groups for spelling achievement were not supported. Correct letter sequences is purported to be more sensitive to change; therefore, this spelling achievement data were used as well as words spelled correct. There were no differences between the groups on either of these achievement measures. It was expected that both the self-recording and self-recording plus self-reinforcement group would outperform the non-

self-recording group. In addition, the self-recording plus self-reinforcement group did not perform as expected. Previous research (Evans & Jones, 1984) has shown that setting stringent standards was more predictive for achievement gains than choosing one's own reinforcer. The teachers were instructed to encourage the students to set high but obtainable goals in addition to choosing their reinforcer. The students may have set goals that were easily obtainable. In addition, self-reinforcement procedures may be more effective if goal setting was public rather than private. There is also the issue of delaying gratification until the end of the week. With this population, they often do not derive sufficient material or social satisfaction from delaying immediate gratification.

Follow-up tests three weeks later on spelling achievement revealed positive results. There were high correlations for all groups in both correct letter sequences and words spelled correct when the posttest was correlated with the follow-up test. There was not a sufficient amount of time left in the school year to do the follow-up later, for example, six weeks after treatment.

The self-recording only group outperformed the other groups for on-task rate during spelling time. It may be difficult to discern whether the intervention of self-recording increased on-task or vice versa. Since the intervention was directly related to academic performance and on-task was observed as a secondary variable, it can be said that the self-recording for spelling increased on-task behavior. The means for percentage of on-task for this group increased slightly from the first week to the sixth week. When looking at the means of average on-task behavior by week for self-recording plus self-reinforcement, this group took a noticeable dip in the fourth week of the treatment. This was immediately following one week of spring break and may have affected this group differently.

To add an interesting component to the study, the investigator attempted to determine if the groups' self-efficacy ratings would improve through self-recording. Schunk (1982-3) has demonstrated that self-monitoring leads to improved self-efficacy which in turn may promote achievement. There were no significant differences between the groups or form week one to week six for the treatment.

In addition, internal and external attributions for success or failure on weekly spelling tests were examined to determine if the groups that self-recorded differed from the control. There were no significant differences for the groups for each week, although it was interesting to note that the control group.attributed their success or failure to internal causes at a higher rate than both the experimental groups. The investigator believes the length of time was not sufficient to adequately assess differences in attributions over time.

Limitations

There were several limitation to this study. The first involved the nature for the selection of the participants. The teachers, therefore, the students were self-selected. The teachers who volunteered to participate for the most part knew the investigator. Thus , the sample was nonrandom and this makes it difficult to generalize to other EBD students. The assignment to the treatments had to be made by classroom. This may have resulted in the nonequivalence of spelling scores among groups on the Spelling Achievement Pretest for words spelled correct.

A second major limitation was the difficulty in conducting research with this population. These students were Level 4 and 5 students in self-contained classrooms (and sometimes alternative placements) who exhibited severely impulsive and aggressive behaviors. Based on the teacher's decision, one classroom dropped from the study due to the students' unpredictable behavior from day to day to consistently

employ the procedures. A review of previous research by Wilson (1984) did not find self-management procedures successful for the aggressive EBD population. Another drawback was the high absentee rate of some students which created holes in the data. It also required the investigator to posttest three students one week later and a few others individually.

Another limitation is the time limit placed on the spelling pre- and posttests. A decision was made to give all groups equal time for writing the spelling words. This caused disruptions by frustrated students yelling obscenities, throwing pencils and ripping up their protocol. Even though the students were encouraged to write parts of words, they were reluctant to do so.

A fourth major limitation was lack of spelling achievement data. Although the weekly scores were collected, they were not used as a dependent variable . Due to the fact that all the students used spelling lists provided by the investigator, they were not necessarily individualized for each student's spelling level. The classroom teacher selected the list she felt was appropriate for the majority of the students; therefore, no initial assessment of the students' level of functioning was sought. The investigator felt that the difficulty of the spelling words and, hence, the difficulty of the pre-post achievement test may have accounted for the nonsignificant findings.

A final limitation was the timing of the study. It was a disadvantage to conduct the study around spring break. Spring break was midpoint, with three weeks prior and three weeks after break. The investigator felt it may have provided a disruption in the continuity of the study. The treatment was also not of sufficient length to discern meaningful differences.

Implications and Suggestions for Future Research

An important implication of these results is that self-recording of daily spelling

scores was effective for higher rates of on-task behavior for at least one group. This effect was true without back-up reinforcers for spelling achievement. This procedure takes advantage of the student's ability to be aware of the variable controlling their behavior and to anticipate consequences. Therefore, students who have acquired the necessary cognitive skills-facility in the use of language, ability to form images, capacity for symbolic thought,--may be more easily taught behavioral self-management. With proper training, students with less severe behavior problems and who can anticipate long-range consequences would benefit from this self-management procedure. This self-recording procedure has potential to be used early on for students with aggressive behaviors as a way of increasing behavioral awareness before behavior escalates.

Second, an issue in self-management has been whether the variable of on-task, work productivity, or academic achievement would be more effective for self-monitoring/recording. Attention or on-task behavior is not an end in itself. The goal of education is learning or achievement. In the case for students with emotional and behavioral disorders, the ultimate goal is increased academic achievement. Students may demonstrate attentive behaviors as a result of self-recording , but if there are not academic gains, the value of the procedure should be questioned. Thus, the outcome measure of academic achievement should be demonstrated in this procedure. The quality of the student's work is more important than quantity in most cases. The structuring of self-management on academic tasks teaches students what to pay attention to which may lead to greater academic gains with simultaneous improvement for on-task behavior.

Third, this self-management procedure allows students to exercise control over traditional teacher activities such as correcting , scoring , recording and choosing

reinforcers. This could be expanded to other activities such as creating worksheets and materials, scheduling and selection of activities.

Finally, very little in the way of materials were required to implement this procedure . It is cost effective in that the materials and personnel are typically found in such environments. For effective implementation in a special education classroom self-management should be as well as easy implement and mange. For the present study, the procedure required a folder with daily recording and graphing forms, which were inexpensive. These procedures should also be highly rated by the personnel and teachers using them. An added bonus for this study was the student's enjoyment. A short measure of student satisfaction was employed in which the results were favorable for self-correcting, daily recording, and graphing of spelling scores.

As suggested previously, it would be beneficial to have a method of identifying for whom self-management is not appropriate. To be effective, students should first demonstrate a positive response to external controls and reinforcement. Therefore, self-management procedures maybe more effective with students as a maintenance procedure, once teacher managed contingencies have been effective in reducing disruptive behavior. I t would also be most beneficial if student recognize the desirability of controlling ones' own behavior.

A further research area would be to determine what aspects of behavior children monitor when motivated to change. Those behaviors involved in assuming responsibility are difficult to master. If it could be determined which of those behaviors motivated children to change when monitored, the intervention could target the most desirable procedure for monitoring.

Questionnaire data from teachers on the value of self-management as a tool for managing behavior should be obtained. It would be important to know if teaches use

self-management and to what extent they see it as a valuable skill for students with emotional and behavioral disorders.

Finally, a future research area would be to implement the treatment for a greater length of time and then determine to what extent and under what conditions the students generalize self-management procedures.

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Table 1

Descriptive Markers for Total Sample

Marker Variable	Control (N = 14)	Experimental 1 (N = 10)	Experimental 2 (N = 14)	Total (N = 38)
Sex				
Male	13	10	14	37
Female	1	0	0	1
Mean Chron. Age	11-8 (10-4 - 12-10)	11-1 (10-4 - 13-3)	12-2 (10-8 - 13-8)	11-10 (10-4 - 13-8)
Locale	Urban	Urban Suburban	Urban Suburban Small Town	
Ethnic Group*				
Black	10	5	7	22
Native American	1	1	0	2
Caucasian	3	4	7	14
Source of Subjects				
Alternative School	8	6	6	20
Public School	6	4	8	18
Educational Placement				
Level 4	6	6	8	20
Level 5	8	4	6	18
Mean Absences	4.8 (0 to 26)	3.6 (0 to 11)	10.4 (0 to 46)	6.5
Socioeconomic Status				
Free Lunch	7	9	10	26
Reduced Lunch	0	0	1	1
Nonreduced	1	1	3	5

*Sight Count by teacher

Table 2
Summary Table for Analysis of Variance for Percentage On-Task for Group

Source	df	MS	F	p
Between				
Group	2	9704.72	18.34	.001*
Error	23	529.15		
Within				
Time (Week 1 to Week 6)	4.71	579.68	2.50	.038*
Group by Time	9.41	931.11	4.01	.001*
Error		304.61		

*$p < .05$